

WHAT IS CLAIMED is:

1. A system for controlling ventricular rate in a heart of a patient, comprising:
  - a cardiac delivery system; and
  - a source of fibroblast cells and/or a biopolymer coupled to the cardiac delivery system,wherein the delivery system is adapted to deliver a volume of material from the source and into or around the patient's AV node, and wherein the volume of fibroblast cells and/or a biopolymer when delivered into or around the AV node causes conduction delay and/or modification of conduction pathways.
2. The system of Claim 1, wherein the cardiac delivery system further comprises at least one needle cooperating and adapted to fluidly couple the at least one needle to the source of fibroblast cells and/or a biopolymer to deliver the material to or around the AV node via the at least one needle.
3. The system of Claim 1, further comprising an injector assembly that is adapted to inject the volume of material via the cardiac delivery system and into or around the AV node.
4. The system of Claim 1, wherein the cardiac delivery system comprises
  - a delivery catheter with an elongated body with a proximal end portion, a distal end portion, and a lumen extending between a proximal port along the proximal end portion and a distal port along the distal end portion; and
  - a transeptal delivery sheath having an elongate body with proximal end portion, a distal end portion, and a delivery passageway extending between a proximal port along the proximal end portion and a distal port along the distal end portion,wherein the transeptal delivery sheath is adapted to provide transeptal access into the left atrium of the heart via the delivery passageway, and wherein the delivery

catheter is adapted to be delivered through the delivery passageway transeptally into the left atrium to thereby deliver the volume of material to or around the AV node.

5. The system of Claim 1, wherein the cardiac delivery system comprises an intracardiac delivery system.

6. The system of Claim 1, wherein the cardiac delivery system comprises an endocardial delivery system.

7. The system of Claim 1, where the cardiac delivery system comprises a transvascular delivery system that is adapted to deliver the volume of material into or around the AV node through a vessel wall of a vessel associated with the cardiac tissue structure.

8. The system of Claim 1, further comprising a kit adapted to prepare autologous cells as the material in an injectable form for delivery with the cardiac delivery system to or around the AV node.

9. The system of Claim 1, wherein the cardiac delivery system comprises at least one needle that is adapted to inject the material into or around the region of tissue at or around the AV node.

10. The system of Claim 1, wherein the cardiac delivery system comprises a catheter having an elongated body with a proximal end portion, a distal end portion, and at least one lumen extending between a proximal port located along the proximal end portion and a distal port located along the distal end portion wherein the proximal port is adapted to couple to a source that contains at least a part of the material.

11. The system of Claim 1 which is useful for treating atrial fibrillation.

12. The system of Claim 1 which is useful for preventing ventricular tachyarrhythmia.

13. A method for controlling the ventricular rate in a heart of a patient, which comprises administering an effective amount of a material comprising fibroblast cells and/or a biopolymer to and/or around the patient's AV nodal area.
14. The method of Claim 13 which causes conduction delay at the AV node.
15. The method of Claim 13 which reduces the incidence of atrial fibrillation.
16. The method of Claim 13 which prevents ventricular tachyarrhythmias.
17. The method of Claim 13, wherein the material is delivered to or around the AV node in a delivery device having a distal end with an anchor and the delivery device distal end is anchored to or around the AV node as material is delivered.
18. The method of Claim 13, material comprising fibroblast cells and/or a biopolymer is delivered to or around the AV node at least in part transeptally across the atrial septum with a transeptal delivery sheath.
19. The method of Claim 13, wherein the fibroblast cells are autologous.
20. The method of Claim 13, wherein the material comprises one or more biopolymers.
21. The method of Claim 20, wherein the biopolymers are selected from the group consisting of fibrin, collagen, alginate, and precursors and/or derivatives thereof, and combinations of two or more thereof.
22. The method of Claim 20, wherein the biopolymer recruits fibroblast cells.
23. The method of Claim 13, wherein the fibroblast cells and/or a biopolymer are administered in at least one injection.

24. The method of Claim 23, wherein there are from about one to about 100 injections.

25. The method of Claim 24, wherein there are from about 10 to about 75 injections.

26. The method of Claim 25, wherein there are from about 20 to about 60 injections.

27. The method of Claim 23 wherein from about one million to about one billion fibroblast cells are administered in each injection.

28. The method of Claim 23 wherein from about 0.01 ml to about 5 ml of biopolymer are administered in each injection.

29. The method of Claim 28 wherein from about 0.1 to about 2 ml of biopolymer are administered in each injection.

30. The method of Claim 23 wherein there are two or more injections and each injection comprises fibroblast cells, a biopolymer, or fibroblast cells in combination with a biopolymer.